Report of the Commercial Space Committee

NASA Advisory Council

NASA Headquarters
April 28, 2010

Commercial Committee Members

- Bretton Alexander, Chair
  - President of the Commercial Spaceflight Federation
- Lon Levin, Vice Chair
  - Co-founder of XM Satellite Radio and other satellite businesses
- Maj Gen Donald Hard (USAF, Ret.)
  - Independent consultant to government and industry
- Bernard A. Harris, Jr., (M.D.)
  - CEO of Vesalius Ventures, former NASA astronaut, and former SPACEHAB executive
- J. Michael Lounge
  - Former NASA astronaut and former Boeing executive
- Patti Grace Smith
  - Former FAA Associate Administrator for Commercial Space Transportation and consultant/advisor to space and aerospace companies
- Wilbur C. Trafton
  - Former NASA Associate Administrator for Space Flight and executive at ILS and Kistler Aerospace
- *John Emond, Executive Secretary*
  - *NASA Innovative Partnerships Program, Office of Chief Technologist*

Work Plan (Draft)

1. Review and advise on how best to optimize NASA's organizational elements and address cultural issues to effectively encourage and promote the development of a commercial space industry.

2. Review NASA's strategy and plans for stimulating a commercial space industry, and provide advice on effective and appropriate methods for NASA to stimulate, encourage and partner with commercial space. What is the logical progression for developing a commercial capability for transportation to ISS and LEO?

3. Review and advise on NASA's strategy for partnering and cooperating with other federal agencies on commercial space.

4. Provide advice on how NASA should define "commercial space" to effectively implement "commercial space" programs and policies.

Meeting Schedule

- Commercial Committee meetings held:
  - February 16, 2010, at NASA Headquarters in Washington, DC
  - March 30, 2010, at NASA Headquarters
  - April 26, 2010, at Johnson Space Center

- Upcoming meetings:
  - Mid-June 2010, most likely at NASA Headquarters
  - Early August 2010, at the Jet Propulsion Lab prior to the full NAC, August 4-6

Presentations to the Committee Feb. 16, 2010

- Overview of NASA's Commercial Space Efforts (Doug Comstock, Director IPP)
- Commercial Reusable Suborbital Research (CRuSR) and a Potential NASA Strategy for achieving Low-Cost and Reliable Access to Space (LCRATS) (Charles Miller, IPP)
- Commercial Cargo and Crew Overview (Geoff Yoder, ESMD)
  - Commercial Crew and Cargo Program
  - Commercial Orbital Transportation Services (COTS) Program
  - Commercial Crew Development (CCDev) Program
  - Integrated Approach for Commercial Crew Services
  - Defining Human Rating Requirements for Commercial Crew
- International Space Station Status (Sam Scimemi, SOMD)
  - ISS Today
  - ISS Cargo and Crew Requirements
  - Current Transportation Arrangements
  - COTS and Commercial Resupply Services (CRS) Flights
  - ISS Commercial Potential

Presentations to the Committee Mar. 30, 2010

- Fact Finding Meetings with U.S. Space industry
  - COTS partners
  - CCDev partners
  - Other major aerospace primes
  - Other commercial space companies

- NASA Briefings
  - Exploration Systems, Michael Hecker
    - Exploration Research and Development
    - Commercial Cargo and Crew
  - Space Operations, Toni Mumford
    - Space Shuttle
    - ISS
    - 21st Century Space Launch Complex
    - Launch Services

Presentations to the Committee Apr. 26, 2010

- Additional Fact Finding Meetings with U.S. Space industry
  - COTS partners
  - CCDev partners
  - Other major aerospace primes
  - Other commercial space companies

- NASA Briefings
  - Peggy Whitson, Human Spaceflight
  - Michael Suffredini, Crew Transportation to and from the ISS
  - Julie Robinson, ISS Utilization
  - Marybeth Edeen, ISS as National Lab
  - Alan Lindenmoyer, COTS program
  - Kathy Lueders, ISS Commercial Resupply Contract
  - Discussion with Eileen Collins, Chair, Space Operations Committee

Findings / Observations / Recommendations

- Submitting one Observation to the NAC:
  - Progress of the Commercial Orbital Transportation Services (COTS) Program
    - Short description of the proposed Observation:
    - The Commercial Orbital Transportation Services (COTS) program to develop and demonstrate commercial capabilities for the delivery of cargo to the International Space Station is moving forward at a deliberate pace. The Commercial Space Committee intends to closely follow the progress of the COTS Cargo program and the use of the proposed $312 million in new funding allotted to "incentivize" the program's participants. The Committee respectfully requests that NASA keep it informed of developments on the program.
    - Major reasons for proposing the Observation:
    - Under the Commercial Orbital Transportation Services (COTS) program, NASA has entered into Space Act Agreements with SpaceX and Orbital Sciences to develop and demonstrate commercial capabilities for the delivery of cargo to the International Space Station. One of the participants, SpaceX, has passed critical design review and is expected to conduct the first of three demonstration flights within the next several months. The other participant, Orbital Sciences, began 18 months later and is undergoing critical design review at the present time and will conduct its only demonstration mission in approximately one year. The Committee notes that SpaceX and Orbital Sciences are behind their proposed schedules.
    - The committee believes that the Commercial Orbital Transportation Services (COTS) program could be a viable model for the commercial space program.

Committee Discussion (cont.)

Commercial Attribute comparison and range: from traditional government ownership and control with unique requirements and custom product, to commercial model of company owned and designed, set price, pay for performance

Attribute	Traditional Govt		Pure Commercial	Space Example
Product type	One-of-a-kind *"bespoke"*	↔ *"tailored"*	Commodity *"off-the-rack"*	gps receivers, Comsats
Customers	NASA only	↔	Ability to serve multiple	
Design	NASA-specified	↔	Company-specified	comsats
Owner/Operator	NASA	↔	Company	Shuttle vs EELV
				Delivery on orbit
Contracting	Cost-plus	↔	Firm-fixed price, pay-for-performance	Comsats
Price	based on cost-plus	↔	Market-based	
Financing	100% NASA	↔	Private financing/ Customer payments	
Risk (perf, financial)	NASA	↔	Company	consumer gps